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<110> Porro, Danilo
Sauer, Michael

<120> Ascorbic Acid Production from Yeast

<130> 2028.594000

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<170> PatentIn Ver. 2.1

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Ser Asn Trp Ser Gly Thr His Glu Val Gln Thr Arg Asn Phe Asn Gln
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Ala Pro Ala Pro Ile Glu Gln Arg Trp Thr Ala Arg Ser Lys Ser Pro
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Lys Asp Lys Glu Glu Leu Glu Ala Leu Gln Ala Arg Ile Arg Lys Arg
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Phe Pro Val Asp Ala Tyr Asn Lys Ala Arg Arg Glu Leu Asp Pro Asn
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Asn Ala Lys His Lys Lys Ala Gln Ile Phe Arg Tyr Ala Pro Leu Pro
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Glu Asp Leu His Thr Val Ser Asn Trp Ser Gly Thr His Glu Val Gln
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Gln Ile Gly Gly Ile Ile Gln Val Gly Ala His Gly Thr Gly Ala Arg

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His Leu Ala Arg Cys Gly Leu Gly Gly Leu Gly Val Val Ala Glu Val
            260                 265                 270

Thr Leu Gln Cys Val Glu Arg Gln Glu Leu Leu Glu His Thr Tyr Val
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    290                 295                 300

Asn Lys His Val Lys Tyr Leu Tyr Ile Pro Tyr Thr Asp Thr Val Val
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Val Val Thr Cys Asn Pro Val Ser Lys Trp Ser Gly Ala Pro Lys Asp
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Lys Pro Lys Tyr Thr Thr Glu Glu Ala Leu Lys His Val Arg Asp Leu
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Gln Gln Trp Val Ser Glu Thr Cys Phe Pro Ala Gly Thr Leu Ala Lys
        435                 440                 445

Pro Ser Met Lys Asp Leu Glu Tyr Ile Glu Gln Leu Lys Glu Leu Ile
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Gln Lys Glu Ala Ile Pro Ala Pro Ser Pro Ile Glu Gln Arg Trp Thr
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Gly Arg Ser Lys Ser Pro Met Ser Pro Ala Phe Ser Thr Ala Glu Glu
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Asp Ile Phe Ser Trp Val Gly Ile Ile Met Tyr Leu Pro Thr Ala Asp
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Pro Arg Gln Arg Lys Asp Ile Thr Asp Glu Phe Phe His Tyr Arg His
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        35                  40                  45

Leu Val Thr Val Gly Ser Gly His Ser Pro Ser Asn Met Cys Val Thr
    50                  55                  60

Asp Glu Trp Leu Val Asn Leu Asp Arg Leu Asp Lys Val Gln Lys Phe
65                  70                  75                  80

Val Glu Tyr Pro Glu Leu His Tyr Ala Asp Val Thr Val Asp Ala Gly
                85                  90                  95

Met Arg Leu Tyr Gln Leu Asn Glu Phe Leu Gly Ala Lys Gly Tyr Ser
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Ile Gln Asn Leu Gly Ser Ile Ser Glu Gln Ser Val Ala Gly Ile Ile
        115                 120                 125

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    130                 135                 140

Gln Tyr Val Asn Leu Thr Ile Val Asn Gly Lys Gly Glu Leu Lys Phe
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Leu Asp Ala Glu Asn Asp Pro Glu Val Phe Lys Ala Ala Leu Leu Ser
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Val Gly Lys Ile Gly Ile Ile Val Ser Ala Thr Ile Arg Val Val Pro
            180                 185                 190

Gly Phe Asn Ile Lys Ser Thr Gln Glu Val Ile Thr Phe Glu Asn Leu
        195                 200                 205

Leu Lys Gln Trp Asp Thr Leu Trp Thr Ser Ser Glu Phe Ile Arg Val
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Thr Thr Asp Ala Gln Asn Gly Pro Ala Lys Ser Trp Trp Gly Thr Lys
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        275                 280                 285

Tyr Gly Lys Leu Glu Lys Ser Ser Thr Gly Asp Val Asn Val Thr Asp
    290                 295                 300

Ser Ile Ser Gly Phe Asn Met Asp Cys Leu Phe Ser Gln Phe Val Asp
305                 310                 315                 320

Glu Trp Gly Cys Pro Met Asp Asn Gly Leu Glu Val Leu Arg Ser Leu
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Asp His Ser Ile Ala Gln Ala Ala Ile Asn Lys Glu Phe Tyr Val His
            340                 345                 350

Val Pro Met Glu Val Arg Cys Ser Asn Thr Thr Leu Pro Ser Glu Pro
        355                 360                 365

Leu Asp Thr Ser Lys Arg Thr Asn Thr Ser Pro Gly Pro Val Tyr Gly
    370                 375                 380

Asn Val Cys Arg Pro Phe Leu Asp Asn Thr Pro Ser His Cys Arg Phe
385                 390                 395                 400

Ala Pro Leu Glu Asn Val Thr Asn Ser Gln Leu Thr Leu Tyr Ile Asn
                405                 410                 415

Ala Thr Ile Tyr Arg Pro Phe Gly Cys Asn Thr Pro Ile His Lys Trp
            420                 425                 430

Phe Thr Leu Phe Glu Asn Thr Met Met Val Ala Gly Gly Lys Pro His
        435                 440                 445

Trp Ala Lys Asn Phe Leu Gly Ser Thr Thr Leu Ala Ala Gly Pro Val
    450                 455                 460

Lys Lys Asp Thr Asp Tyr Asp Asp Phe Glu Met Arg Gly Met Ala Leu
465                 470                 475                 480

Lys Val Glu Glu Trp Tyr Gly Glu Asp Leu Lys Lys Phe Arg Lys Ile
                485                 490                 495

Arg Lys Glu Gln Asp Pro Asp Asn Val Phe Leu Ala Asn Lys Gln Trp
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Leu Val Thr Val Gly Ser Gly His Ser Pro Ser Asn Met Cys Val Thr
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Asp Glu Trp Leu Val Asn Leu Asp Arg Leu Asp Lys Val Gln Lys Phe
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Val Glu Tyr Pro Glu Leu His Tyr Ala Asp Val Thr Val Asp Ala Gly
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Met Arg Leu Tyr Gln Leu Asn Glu Phe Leu Gly Ala Lys Gly Tyr Ser
100 105 110

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    130                 135                 140

Gln Tyr Val Asn Leu Thr Ile Val Asn Gly Lys Gly Glu Leu Lys Phe
145                 150                 155                 160

Leu Asp Ala Glu Asn Asp Pro Glu Val Phe Lys Ala Ala Leu Leu Ser
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Val Gly Lys Ile Gly Ile Ile Val Ser Ala Thr Ile Arg Val Val Pro
            180                 185                 190

Gly Phe Asn Ile Lys Ser Thr Gln Glu Val Ile Thr Phe Glu Asn Leu
        195                 200                 205

Leu Lys Gln Trp Asp Thr Leu Trp Thr Ser Ser Glu Phe Ile Arg Val
    210                 215                 220

Trp Trp Tyr Pro Tyr Thr Arg Lys Cys Val Leu Trp Arg Gly Asn Lys
225                 230                 235                 240

Thr Thr Asp Ala Gln Asn Gly Pro Ala Lys Ser Trp Trp Gly Thr Lys
                245                 250                 255

Leu Gly Arg Phe Phe Tyr Glu Thr Leu Leu Trp Ile Ser Thr Lys Ile
            260                 265                 270

Tyr Ala Pro Leu Thr Pro Phe Val Glu Lys Phe Val Phe Asn Arg Gln
        275                 280                 285

Tyr Gly Lys Leu Glu Lys Ser Ser Thr Gly Asp Val Asn Val Thr Asp
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Ser Ile Ser Gly Phe Asn Met Asp Cys Leu Phe Ser Gln Phe Val Asp
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Glu Trp Gly Cys Pro Met Asp Asn Gly Leu Glu Val Leu Arg Ser Leu
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Val Pro Met Glu Val Arg Cys Ser Asn Thr Thr Leu Pro Ser Glu Pro
        355                 360                 365

Leu Asp Thr Ser Lys Arg Thr Asn Thr Ser Pro Gly Pro Val Tyr Gly
    370                 375                 380

Asn Val Cys Arg Pro Phe Leu Asp Asn Thr Pro Ser His Cys Arg Phe
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Ala Pro Leu Glu Asn Val Thr Asn Ser Gln Leu Thr Leu Tyr Ile Asn
                405                 410                 415
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    450                 455                 460

Lys Lys Asp Thr Asp Tyr Asp Asp Phe Glu Met Arg Gly Met Ala Leu
465                 470                 475                 480

Lys Val Glu Glu Trp Tyr Gly Glu Asp Leu Lys Lys Phe Arg Lys Ile
                485                 490                 495

Arg Lys Glu Gln Asp Pro Asp Asn Val Phe Leu Ala Asn Lys Gln Trp
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caagaagtga ttacttttga aaacctttg aagcaatggg ataccctatg gacttcatct 660
gaatttatca gagtttggtg gtaccttat actagaaaat gtgttctatg gaggggtaac 720
aaaactacag atgcccaaaa tggtccagcc aagtcatggt ggggtaccaa gctgggtaga 780
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<210> 9
<211> 440
<212> PRT
<213> Rattus norvegicus

<400> 9

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Tyr Gly Cys Ser Pro Glu Val Tyr Tyr Gln Pro Thr Ser Val Glu Glu
            20                  25                  30

Val Arg Glu Val Leu Ala Leu Ala Arg Glu Gln Lys Lys Lys Val Lys
        35                  40                  45

Val Val Gly Gly Gly His Ser Pro Ser Asp Ile Ala Cys Thr Asp Gly
    50                  55                  60

Phe Met Ile His Met Gly Lys Met Asn Arg Val Leu Gln Val Asp Lys
65                  70                  75                  80

Glu Lys Lys Gln Ile Thr Val Glu Ala Gly Ile Leu Leu Ala Asp Leu
                85                  90                  95

His Pro Gln Leu Asp Glu His Gly Leu Ala Met Ser Asn Leu Gly Ala
            100                 105                 110

Val Ser Asp Val Thr Val Ala Gly Val Ile Gly Ser Gly Thr His Asn
        115                 120                 125

Thr Gly Ile Lys His Gly Ile Leu Ala Thr Gln Val Val Ala Leu Thr
    130                 135                 140

Leu Met Thr Ala Asp Gly Glu Val Leu Glu Cys Ser Glu Ser Arg Asn
145                 150                 155                 160

Ala Asp Val Phe Gln Ala Ala Arg Val His Leu Gly Cys Leu Gly Ile
                165                 170                 175

Ile Leu Thr Val Thr Leu Gln Cys Val Pro Gln Phe Gln Leu Gln Glu
            180                 185                 190

Thr Ser Phe Pro Ser Thr Leu Lys Glu Val Leu Asp Asn Leu Asp Ser
        195                 200                 205

His Leu Lys Arg Ser Glu Tyr Phe Arg Phe Leu Trp Phe Pro His Thr
    210                 215                 220
```

```
Glu Asn Val Ser Ile Ile Tyr Gln Asp His Thr Asn Lys Ala Pro Ser
225                 230                 235                 240

Ser Ala Ser Asn Trp Phe Trp Asp Tyr Ala Ile Gly Phe Tyr Leu Leu
                245                 250                 255

Glu Phe Leu Leu Trp Thr Ser Thr Tyr Leu Pro Cys Leu Val Gly Trp
            260                 265                 270

Ile Asn Arg Phe Phe Phe Trp Met Leu Phe Asn Cys Lys Lys Glu Ser
        275                 280                 285

Ser Asn Leu Ser His Lys Ile Phe Thr Tyr Glu Cys Arg Phe Lys Gln
    290                 295                 300

His Val Gln Asp Trp Ala Ile Pro Arg Glu Lys Thr Lys Glu Ala Leu
305                 310                 315                 320

Leu Glu Leu Lys Ala Met Leu Glu Ala His Pro Lys Val Val Ala His
                325                 330                 335

Tyr Pro Val Glu Val Arg Phe Thr Arg Gly Asp Asp Ile Leu Leu Ser
            340                 345                 350

Pro Cys Phe Gln Arg Asp Ser Cys Tyr Met Asn Ile Ile Met Tyr Arg
        355                 360                 365

Pro Tyr Gly Lys Asp Val Pro Arg Leu Asp Tyr Trp Leu Ala Tyr Glu
    370                 375                 380

Thr Ile Met Lys Lys Phe Gly Gly Arg Pro His Trp Ala Lys Ala His
385                 390                 395                 400

Asn Cys Thr Gln Lys Asp Phe Glu Glu Met Tyr Pro Thr Phe His Lys
                405                 410                 415

Phe Cys Asp Ile Arg Glu Lys Leu Asp Pro Thr Gly Met Phe Leu Asn
            420                 425                 430

Ser Tyr Leu Glu Lys Val Phe Tyr
        435                 440
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<210> 10
<211> 2120
<212> DNA
<213> Rattus norvegicus

<400> 10

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tcagagaggt gctggccctg gcccgggagc agaagaagaa agtgaaggtg gtgggtggtg 180
gccactcgcc ttcagacatt gcctgcactg acggtttcat gatccacatg ggcaagatga 240
accgggttct ccaggtggac aaggagaaga agcagataac agtggaagcc ggtatcctcc 300
tggctgacct gcacccacag ctggatgagc atggcctggc catgtccaat ctgggagcag 360
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<210> 11
<211> 319
<212> PRT
<213> Arabidopsis thaliana

<400> 11
Met Thr Lys Ile Glu Leu Arg Ala Leu Gly Asn Thr Gly Leu Lys Val
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Ser Ala Val Gly Phe Gly Ala Ser Pro Leu Gly Ser Val Phe Gly Pro
20 25 30

Val Ala Glu Asp Asp Ala Val Ala Thr Val Arg Glu Ala Phe Arg Leu
35 40 45

Gly Ile Asn Phe Phe Asp Thr Ser Pro Tyr Tyr Gly Gly Thr Leu Ser
50 55 60

Glu Lys Met Leu Gly Lys Gly Leu Lys Ala Leu Gln Val Pro Arg Ser
65 70 75 80

Asp Tyr Ile Val Ala Thr Lys Cys Gly Arg Tyr Lys Glu Gly Phe Asp
85 90 95

Phe Ser Ala Glu Arg Val Arg Lys Ser Ile Asp Glu Ser Leu Glu Arg
100 105 110

```
Leu Gln Leu Asp Tyr Val Asp Ile Leu His Cys His Asp Ile Glu Phe
        115                 120                 125

Gly Ser Leu Asp Gln Ile Val Ser Glu Thr Ile Pro Ala Leu Gln Lys
    130                 135                 140

Leu Lys Gln Glu Gly Lys Thr Arg Phe Ile Gly Ile Thr Gly Leu Pro
145                 150                 155                 160

Leu Asp Ile Phe Thr Tyr Val Leu Asp Arg Val Pro Pro Gly Thr Val
                165                 170                 175

Asp Val Ile Leu Ser Tyr Cys His Tyr Gly Val Asn Asp Ser Thr Leu
            180                 185                 190

Leu Asp Leu Leu Pro Tyr Leu Lys Ser Lys Gly Val Gly Val Ile Ser
        195                 200                 205

Ala Ser Pro Leu Ala Met Gly Leu Leu Thr Glu Gln Gly Pro Pro Glu
    210                 215                 220

Trp His Pro Ala Ser Pro Glu Leu Lys Ser Ala Ser Lys Ala Ala Val
225                 230                 235                 240

Ala His Cys Lys Ser Lys Gly Lys Lys Ile Thr Lys Leu Ala Leu Gln
                245                 250                 255

Tyr Ser Leu Ala Asn Lys Glu Ile Ser Ser Val Leu Val Gly Met Ser
            260                 265                 270

Ser Val Ser Gln Val Glu Glu Asn Val Ala Ala Val Thr Glu Leu Glu
        275                 280                 285

Ser Leu Gly Met Asp Gln Glu Thr Leu Ser Glu Val Glu Ala Ile Leu
    290                 295                 300

Glu Pro Val Lys Asn Leu Thr Trp Pro Ser Gly Ile His Gln Asn
305                 310                 315
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<210> 12
<211> 960
<212> DNA
<213> Arabidopsis thaliana

<400> 12
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accgtgcgcg aggctttccg tctcggtatc aacttcttcg acacctcccc gtattatgga 180
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gctcttcaga aactgaaaca agaggggaag acccggttca ttggtatcac tggtcttccg 480
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tcatactgtc attacggcgt taatgattcg acgttgctgg atttactacc ttacttgaag 600

agcaaaggtg tgggtgtgat aagtgcttct ccattagcaa tgggcctcct tacagaacaa 660
ggtcctcctg aatggcaccc tgcttcccct gagctcaagt ctgcaagcaa agccgcagtt 720
gctcactgca aatcaaaggg caagaagatc acaaagttag ctctgcaata cagtttagca 780
aacaaggaga tttcgtcggt gttggttggg atgagctctg tctcacaggt agaagaaaat 840
gttgcagcag ttacagagct tgaaagtctg gggatggatc aagaaactct gtctgaggtt 900
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<210> 13
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: motif I of
aldo-keto reductase superfamily

<400> 13
Gly Xaa Arg Xaa Xaa Asp Xaa Ala Xaa Xaa Xaa Xaa Xaa Glu Xaa Xaa
1 5 10 15

Xaa Gly

<210> 14
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward PCR
Primer for L-galactono-1,4-lactone dehydrogenase
from A. thaliana

<400> 14
caagaaggcc taaatgttcc gttacgctcc 30

<210> 15
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse PCR
Primer for L-galactono-1,4-lactone dehydrogenase
from A. thaliana

<400> 15
atgggccctt aagcagtggt ggagactggg 30

<210> 16
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward PCR Primer for L-gulono-1,4-lactone oxidase from R. norvegicus

<400> 16
tgaggggtca gggtggtttg tttcca 26

<210> 17
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse PCR Primer for L-gulono-1,4-lactone oxidase from R. norvegicus

<400> 17
tggaatcatg gtccatgggt acaaaggg 28

<210> 18
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward PCR Primer for D-arabinono-1,4-lactone oxidase from S. cerevisiae

<400> 18
tttcaccata tgtctactat cc 22

<210> 19
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse PCR Primer for D-arabinono-1,4-lactone oxidase from S. cerevisiae

<400> 19
aaggatccta gtcggacaac tc 22

<210> 20
<211> 344
<212> PRT
<213> Saccharomyces cerevisiae

<400> 20

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Met Ser Ser Ser Val Ala Ser Thr Glu Asn Ile Val Glu Asn Met Leu
 1               5                  10                  15

His Pro Lys Thr Thr Glu Ile Tyr Phe Ser Leu Asn Asn Gly Val Arg
            20                  25                  30

Ile Pro Ala Leu Gly Leu Gly Thr Ala Asn Pro His Glu Lys Leu Ala
        35                  40                  45

Glu Thr Lys Gln Ala Val Lys Ala Ala Ile Lys Ala Gly Tyr Arg His
    50                  55                  60

Ile Asp Thr Ala Trp Ala Tyr Glu Thr Glu Pro Phe Val Gly Glu Ala
65                  70                  75                  80

Ile Lys Glu Leu Leu Glu Asp Gly Ser Ile Lys Arg Glu Asp Leu Phe
                85                  90                  95

Ile Thr Thr Lys Val Trp Pro Val Leu Trp Asp Glu Val Asp Arg Ser
            100                 105                 110

Leu Asn Glu Ser Leu Lys Ala Leu Gly Leu Glu Tyr Val Asp Leu Leu
        115                 120                 125

Leu Gln His Trp Pro Leu Cys Phe Glu Lys Ile Lys Asp Pro Lys Gly
    130                 135                 140

Ile Ser Gly Leu Val Lys Thr Pro Val Asp Asp Ser Gly Lys Thr Met
145                 150                 155                 160

Tyr Ala Ala Asp Gly Asp Tyr Leu Glu Thr Tyr Lys Gln Leu Glu Lys
                165                 170                 175

Ile Tyr Leu Asp Pro Asn Asp His Arg Val Arg Ala Ile Gly Val Ser
            180                 185                 190

Asn Phe Ser Ile Glu Tyr Leu Glu Arg Leu Ile Lys Glu Cys Arg Val
        195                 200                 205

Lys Pro Thr Val Asn Gln Val Glu Thr His Pro His Leu Pro Gln Met
    210                 215                 220

Glu Leu Arg Lys Phe Cys Phe Met His Asp Ile Leu Leu Thr Ala Tyr
225                 230                 235                 240

Ser Pro Leu Gly Ser His Gly Ala Pro Asn Leu Lys Ile Pro Leu Val
                245                 250                 255

Lys Lys Leu Ala Glu Lys Tyr Asn Val Thr Gly Asn Asp Leu Leu Ile
            260                 265                 270

Ser Tyr His Ile Arg Gln Gly Thr Ile Val Ile Pro Arg Ser Leu Asn
        275                 280                 285

Pro Val Arg Ile Ser Ser Ser Ile Glu Phe Ala Ser Leu Thr Lys Asp
    290                 295                 300
```

Glu Leu Gln Glu Leu Asn Asp Phe Gly Glu Lys Tyr Pro Val Arg Phe
305 310 315 320

Ile Asp Glu Pro Phe Ala Ala Ile Leu Pro Glu Phe Thr Gly Asn Gly
325 330 335

Pro Asn Leu Asp Asn Leu Lys Tyr
340

<210> 21
<211> 1509
<212> DNA
<213> Saccharomyces cerevisiae

<400> 21
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aagccgctct acccttacct ccgcctggaa aaattataat atataaagtg agcctcgtaa 180
tacaggggta aaaaggaaag agggggatat caagcatctg gacttatttg cactatctcc 240
gccttcaatt gataaaagcg tcttgatttt aatcaactgc tatcatgtct tcttcagtag 300
cctcaaccga aaacatagtc gaaaatatgt tgcatccaaa gactacagaa atatactttt 360
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agttagctga aacaaaacaa gccgtaaaag ctgcaatcaa agctggatac aggcacattg 480
atactgcttg ggcctacgag acagagccat tcgtaggtga agccatcaag gagttattag 540
aagatggatc tatcaaaagg gaggatcttt tcataaccac aaaagtgtgg ccggttctat 600
gggacgaagt ggacagatca ttgaatgaat ctttgaaagc tttaggcttg gaatacgtcg 660
acttgctctt gcaacattgg ccgctatgtt ttgaaaagat taaggaccct aaggggatca 720
gcggactggt gaagactccg gttgatgatt ctggaaaaac aatgtatgct gccgacggtg 780
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caggaaatga cttgctaatt tcttaccata ttagacaagg cactatcgta attccgagat 1140
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cagccatcct tccagagttt actggtaacg gaccaaactt ggacaattta aagtattaag 1320
acaacgactt tattttcact ttatttagtt cgcttcttaa tcttgtcaaa aacaagatat 1380
tgtgtaatcg cctcaagtaa acaatatgtt tttcatacgt gatttgaagt ttttaagtat 1440
ctgaaataca tacgcgcgcg tatgcatatg tattagttaa attactcgaa tgtcctttat 1500
ataatatta 1509

<210> 22
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Forward PCR Primer for L-galactose dehydrogenase from A. thaliana

<400> 22
atgacgaaaa tagagcttcg agc 23

<210> 23
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse PCR Primer for L-galactose dehydrogenase from A. thaliana

<400> 23
ttagttctga tggattccac ttgg 24

<210> 24
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Saccharomyces cerevisiae

<400> 24
atgtcttctt cagtagcctc aacc 24

<210> 25
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Reverse PCR Primer for D-arabinose dehydrogenase from S. cerevisiae

<400> 25
ttaatacttt aaattgtcca agtttggtc 29

<210> 26
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: motif II of aldo-keto reductase superfamily

<400> 26
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1